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ABSTRACT

This report describes a process developed by the Center for Assessment of Administrative Performance (CAAP) in Washington State which uses microcomputers to generate feedback reports for participants in an assessment process which provides participants with feedback on skills and abilities related to the successful performance of school building administrators. Noting that the system consists of a set of six simulation exercises which have been designed to measure 136 behavioral descriptors, the report describes the process by which scores for all exercises are weighted and combined to produce overall descriptor scores which, in turn, are weighted and combined to produce scores on 12 skill and ability dimensions, i.e., instructional leadership and supervision, human relations competence, judgement, organizational ability, educational values, oral communication, written communication, problem analysis, creativity, decisiveness, group leadership, and resourcefulness. The Microrim R:Base database used to generate the feedback documents and the content of the documents themselves are described. In addition, sample feedback documents are provided. (GL)

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SOME TECHNICAL ASPECTS OF PROVIDING COMPUTERIZED FEEDBACK REPORTS

PAPER FOR PRESENTATION AT THE
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BY

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SEATTLE, WASHINGTON

APRIL, 1990

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Some Technical Aspects of Providing Computerized Feedback Reports.

Abstract:

The Center for Assessment of Administrative Performance (CAAP) in Washington State has developed a process which uses microcomputers to generate feedback reports for participants in the Center's assessment process. The CAAP assessment provides participants with feedback on skills and abilities related to successful performance as school building administrators. It consists of a set of six simulation exercises which have been designed to measure 136 behavioral descriptors. Scores for all exercises are weighted and combined to produce overall descriptor scores which, in turn, are weighted and combined to produce scores on twelve skill and ability dimensions. Feedback documents which detail the performance of each assessment participant are then produced. Each document contains a description of the assessment process and specific information on the participant's performance. This information includes an overall score on each dimension, descriptors on which high or low performance was measured, and scores on two of the exercises which were judged to be of particular importance.

The computer system used to generate the documents includes an IBM PS/2 Model 80 with two megabytes of RAM, and a NEC Quietwriter PostScript laser printer. Four software packages are currently in use by CAAP. Microsoft's Excel spreadsheet program is used for data entry

and calculation of descriptor scores. The feedback documents are generated by a Microsoft Word form letter document which merges data generated by the Excel spreadsheet. Data are accumulated and certain summary reports are generated by a Microrim R:Base database. Data from the database can be exported either to Microsoft Word to generate complex form documents or to files for use by SPSS/PC+ or other statistical analysis programs. In the future, CAAP plans to investigate the use of scanner technology for data entry.

Introduction

The designers of the CAAP assessment process were faced with a three-fold challenge. They needed to develop a method which would allow scores earned by assessment participants on several simulation exercises to be weighted and synthesized to result in overall performance scores, and to generate a comprehensive feedback document which would be customized for each assessment participant. Further, the entire process of scoring and generating the feedback reports was to take no more than two days. Finally, the data would also be used to generate reports on group performance and for research purposes.

The CAAP Assessment Process

Figure 1.

A microcomputer-based system has been devised which meets these requirements. The CAAP assessment process consists of four main steps, as outlined in figure 1. Six simulation exercises are used to measure performance on 136 behavioral descriptors which form the basis of overall ratings of twelve skill and ability dimensions. Two days are required for participants to complete the exercises, and a maximum of twelve persons can be assessed at one time.

The simulation exercises include the following:

1. Instructional Analysis Exercise (five parts):
    A. Knowledge Survey,
    B. Lesson Analysis,
    C. Planning a Post-Observation Conference
    D. Conducting the Post-Observation Conference
    E. Written Summary
2. In-Basket Exercise (17 items)
3. Written Case Study Exercise (two cases)
4. Leaderless Group Discussion Exercise (one activity)

5. Selection/Interview Exercise (th ee activities):

   A. Planning the Employment Interview

   B. Interview Role-Play

   C. Writing a Recommendation to the Superintendent

6. Encounter Exercise (three activities):

   A. Student Fight - written

   B. Disgruntled Business Teacher - role-play and written

   C. Teacher/Teacher's Aide Conflict - written

The twelve skill and ability dimensions measured by the CAAP assessment are as follows:

	Dimension	Number of descriptors
1.	Instructional Leadership and supervision	19
2.	Human Relations Competence	14
3.	Judgement	13
4.	Organizational Ability	15
5.	Educational Values	10
6.	Oral Communication	12
7.	Written Communication	9
8.	Problem Analysis	10
9.	Creativity	11
10.	Decisiveness	6
11.	Group Leadership	8
12.	Resourcefulness	9

The exercises are scored by volunteers during a one-day scoring session. Scorers are trained to watch for specific behaviors and to

assess the degree to which the participants successfully complete each task. Each exercise is scored by more than one assessor. After the assessors finish scoring an exercise individually, they must reconcile any differences to produce their final "composite" scores, which are then used to provide feedback to the participant.

The exercise scores are entered into the computer and are combined and weighted to calculate scores on the behavioral descriptors. Descriptor scores are then combined to produce overall scores on the dimensions. Finally, a feedback document is generated for each participant.

Each individual who participates in the assessment receives his or her results during a one-on-one feedback session. The feedback document is presented to the participant and reviewed in detail. Since one of the main purposes of the assessment is to help participants target their professional growth activities, this meeting is in many respects the most important event in the assessment process. Interpretation of the assessment results is crucial to its effective application.

In addition to providing feedback on individuals' performance, the data are put to other uses. Reports to school districts are generated when six or more persons from that school district have completed the assessment process. These reports provide a profile of the group as a whole, pointing out areas where district-wide training might provide significant improvement, and conversely, where additional training is not urgently needed. Group reports can be generated using any subset of

the data (e.g. by district, by district or school size, by participants' demographic profiles, or any combination of such characteristics.)

The data can also be exported to files for statistical analysis. Some of the ways these data can be used include item analysis, study of inter-rater reliability, and for use in studies of external validity.

Overview of the report generating system

The data processing system used by CAAP is based on an IBM PS/2 Model 80. This computer uses an Intel 80386 processor and the Micro-Channel Architecture (MCA) bus, VGA color video, and two megabytes of RAM. Currently, CAAP uses a NEC Quietwriter PostScript laser printer with a rated output speed of eight pages per minute. Since each report is approximately sixteen pages long, a slower printer would require an unacceptably long time to produce the final documents.

System development was originally begun on a Macintosh, but ultimately ported to the IBM to take advantage of the 80386 processor's speed, better cost to performance ratio, and the larger pool of software available for data analysis and storage. Little translation of the spreadsheet and form documents was needed due to the compatibility between Microsoft's IBM and Macintosh versions of Excel and Word. (With recent improvements in the Macintosh line, it would be possible to port these parts of the system back to the Macintosh if this became desirable. CAAP has no current plans to do so, however.)

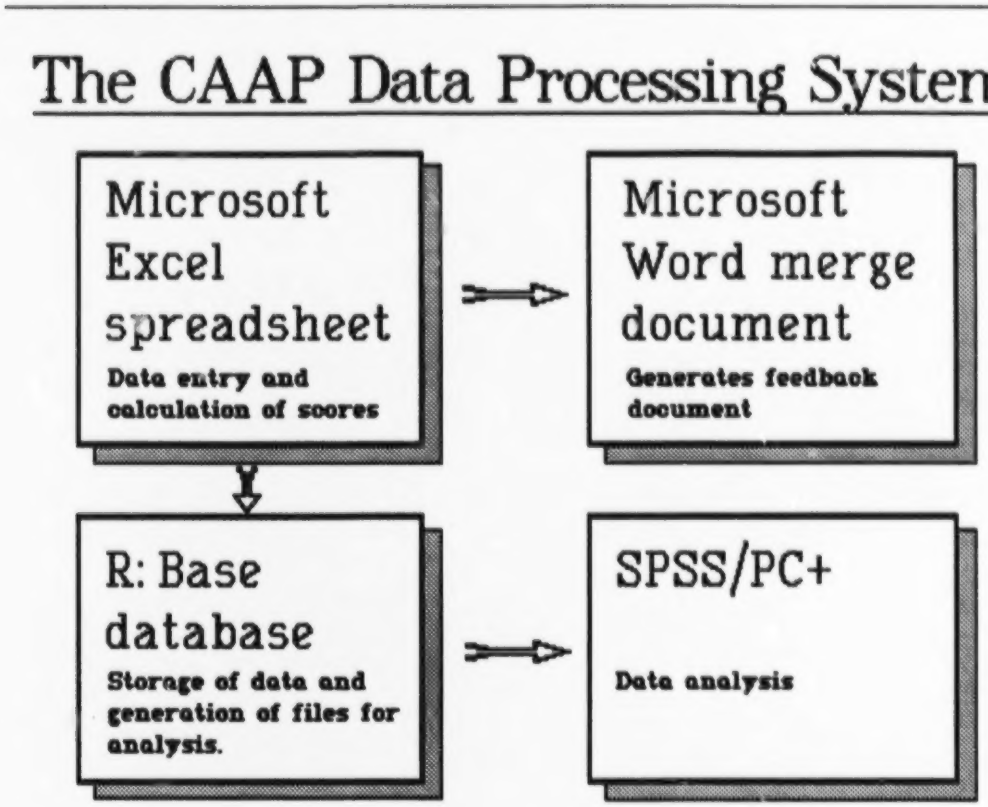
The CAAP Data Processing System
Microsoft Excel spreadsheet
Data entry and calculation of scores
Microsoft Word merge document
Generates feedback document
R: Base database
Storage of data and generation of files for analysis.
SPSS/PC+
Data analysis

Figure 2.

Figure two shows an overview of the CAAP data processing system. The initial step in the process is entry of the exercise scores into an Excel spreadsheet named WEIGHTS. This spreadsheet has three main sections: input lines, the calculation matrix, and an output line, as shown in figure 3. Arranging the spreadsheet in this way makes data entry possible either by hand or from data files generated by scanned forms or from the R:Base database. The calculation matrix can be readily adjusted when necessary and scores recomputed. If changes to

the exercise weights are made, the original exercise scores can be retrieved from the database, allowing quick recalculation of descriptor and dimension scores. The spreadsheet design also allows both exercise scores and calculated overall scores to be transferred to the database directly without reentry.

Spreadsheet layout

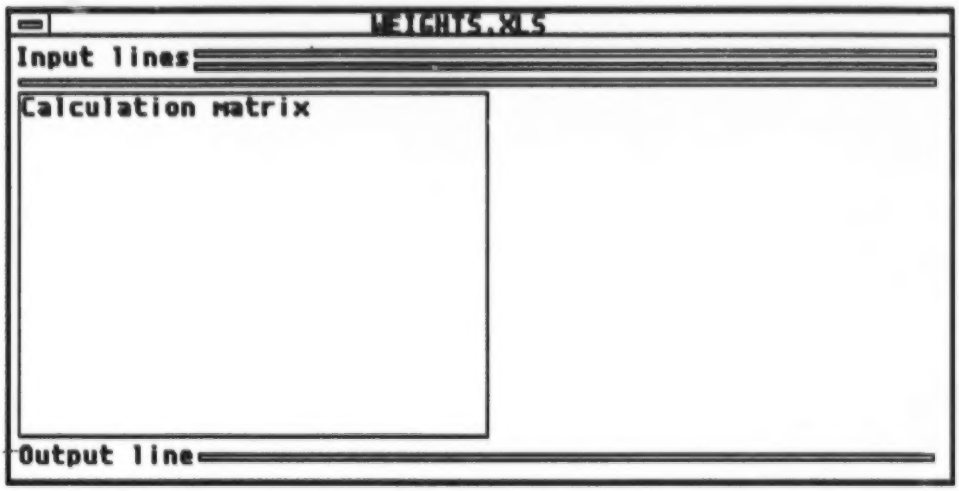

Figure 3.

Descriptors may be measured on only one exercise, or as many as a dozen or more times in different exercises. On average, descriptors are measured four to five times each. Multiple measurements of descriptors ensure accuracy of the scores ultimately associated with the descriptors and dimensions. The descriptor score is calculated based on the weight

assigned to each measurement. Each descriptor has been individually weighted to reflect the relative importance of each measure in influencing the final score. Dimension scores, in turn, are calculated based on the weights assigned to each descriptor score.

Calculation Matrix

	D0101	D0102	...	D0100	D0201	...
Instr. Analy						
K.S.						
L.A.	S_{1a}	S_{1a}				
Plan Conf		S_{pc}			S_{pc}	
Cond Conf	S_{cc}					
W.S.						
Ex Score	$\Sigma(S \cdot W_s)$	$\Sigma(S \cdot W_s)$			$\Sigma(S \cdot W_s)$	
In-Basket						
Item 1						
Item 2						
Item 3	S_{ih3}					
...						
Dim/Des Scr	$\Sigma(Ex \cdot W_e)$	$\Sigma(Ex \cdot W_e)$	...	$\Sigma(Di \cdot W_d)$	$\Sigma(Ex \cdot W_e)$	

S = Score on specific measure.
W_s= Weight of specific measure (relative to other measures in same exercise.)
Ex = Exercise score, i.e. $\Sigma(S \cdot W_s)$.
W_e = Weight of exercise.
Di = Dimension score, i.e. $\Sigma(Ex \cdot W_e)$.
W_d = Weight of descriptor.

Figure 4.

The calculation matrix portion of the WEIGHTS spreadsheet is laid out as it would be on a large sheet of paper. Each exercise part has its own row, and each descriptor and dimension has a column (see figure 4.) Each cell in the matrix, then, represents one measure of the individual's performance on a single descriptor for a single exercise, scaled from zero (the lowest possible score) to one (highest.) On the

Group Discussion exercise, where some measurements may not be possible depending upon the group's process, a score of "N" may be assigned to indicate that no opportunity arose for measurement of that descriptor. When an "N" score is assigned, the Group Discussion measure is excluded before descriptor scores are calculated.

For each descriptor column, a score for each complete exercise is calculated first. Each measure is assigned a weight, and these weighted measures in each exercise are added together to produce an exercise score, again scaled from zero to one.

The overall descriptor score is then calculated by weighting each exercise score and adding these weighted scores together. This time, however, the scores are scaled from zero to 100 and rounded to the nearest integer.

Finally, to produce the overall dimension score, the related descriptor scores are weighted and added together. Again, the scores are scaled in whole numbers from zero to 100.

Scores for a particular session are accumulated in four files, one line of data per participant in each file. After all participants' scores have been entered and calculated, these files are saved as character delimited ASCII files for use both as data documents for report generation and for loading into the database. An Excel macro can accomplish this step automatically.

Microsoft Word's form letter generation capabilities make the production of the feedback document possible. The CAAP process makes extensive use of the logical IF...THEN...ELSE statements available in

Word to customize the feedback document. The MAINDOC file contains all the text and logic needed to generate feedback documents. (See Appendix A for sample pages from the MAINDOC file.) Data from the SCORES.TXT file produced by Excel is merged with MAINDOC to produce the feedback document. Two versions of this document are printed, one with notations for use by the CAAP staff member who conducts the feedback session, and the other for the participant. The notations are formatted as hidden text. Word provides a toggle to print hidden text, allowing the same final document file to produce both versions of the document.

(A similar process is used to produce the group reports mentioned previously. To produce this report, a subset of data, which has been selected from the database, is loaded into an Excel spreadsheet which calculates statistics regarding the group's performance. These statistics are then saved as a text file and merged with a group report main document file to produce the group report document.)

The CAAP data processing system uses Microrim's R:Base database software to accumulate data and generate files for statistical analysis. Its extensive file importing and exporting facilities make it possible to take text files generated by Excel and incorporate them into the database. In addition, subsets of the data can be exported for use in many other programs. Data sets from R:Base are used in Excel and in SPSS/PC+.

The data are kept in several tables in the R:Base database. Most of these are loaded directly from Excel text files, but two of them (biographical data on participants and records of who scored which

exercises) are entered into the database directly. This is facilitated by use of R:Base's screen input capability.

The R:Base tables used in the system are as follows:

1. BIOGDAT — Biographical data on participants
2. SCORES — Calculated descriptor and dimension scores
3. EXSCOR1 — Scores on Instructional Analysis and In-Basket exercises
4. EXSCOR2 — Scores on Cases and Group Discussion exercises
5. EXSCOR3 — Scores on Selection/Interview and Encounter exercises
6. NAMES — Names and addresses of participants
7. BYWHOM — Names of role players and scorers

Output files can combine data from any of the tables. Any combination of exercise scores, demographic data, dimension or descriptor scores, can be used as selection criteria to define subsets of the data. R:Base also has the ability to generate descriptive statistics (counts, sums, means, variances, etc.) directly from data stored in its tables.

SPSS/PC+, version 3.1 is currently in use at CAAP for statistical analysis. Data sets generated by R:Base are used by SPSS. This statistical analysis program can perform most generally used statistical analysis techniques.

Future developments

With increasing numbers of participants, CAAP has begun looking at the use of scanners to enter scores into the system. The WEIGHTS spreadsheet has been designed with this eventuality in mind. Scanning data entry forms would eliminate one potential source of input error. Other possibilities include having scorers enter their scores directly into portable computers, which would reduce the possibility of errors that can occur when filling in scoring forms. This would also improve the portability of the assessment process, allowing scores to be transmitted from the computers at the assessment site to the PS/2 at the CAAP office.

Computers might also be designed into the assessment exercises directly, as stimulus and response devices. Although this offers some intriguing possibilities, the difficulty with this idea is in reducing the bias it would have toward those with well developed skills on the computer keyboard.

Conclusion

Microcomputers provide the capability to generate detailed reports to assessment participants quickly and accurately. The system implemented at the Center for Assessment of Administrative Performance has been successfully used since 1988 to provide comprehensive feedback to assessment participants. The report production process, which involves data entry, document generation and printout, and consolidation of data into the R:Base database, takes about six hours for twelve participants.

Appendix A: Sample pages from MAINDOC.

(See following pages.)

RESULTS

The results of the Performance on Dimensions are as follows:

Instructional Leadership, Supervision

> ***Instructional leadership and supervision*** **is defined as follows: Understands the instructional process and is well versed in a variety of instructional techniques; evaluates classroom instruction relative to teacher objectives and student performance; and works effectively with teachers to improve instruction.**

«IF DMAX=1»The overall performance on this dimension was *exceptional*. Responses to the exercises were in a range above those expected even for acceptable behavior. Additional training pertinent to this dimension may not provide much improvement.«endif»«IF DMIN=1»The overall performance on this dimension shows *strong potential for improvement*. Responses to the exercises were in a range that may not be considered acceptable in some situations. This represents an area where it might be quite worthwhile to seek additional training for improvement in related skills. «endif»«IF DMED=1»The overall performance on this dimension was *effective*. Responses to the exercises were in a range that is considered quite acceptable. Additional training related to this dimension may provide improvement, but should not be considered necessary to result in acceptable performance in this area.«endif»

«IF D101>79 or D102>79 or D103>79 or D104>79 or D105>79 or D106>79 or D107>79 or D108>79 or D109>79 or D110>79 or D111>79 or D112>79 or D113>79 or D114>79 or D115>79 or D116>79 or D117>79 or D118>79 or D119>79»Responses pertinent to this dimension demonstrated *high performance* in:

«IF D101>79»• describing the specific activities of the principal as an instructional leader
«endif»«IF D102>79»• describing the role of the principal as an instructional supervisor
«endif»«IF D103>79»• specifying major purposes for analyzing instruction
«endif»«IF D104>79»• identifying effective classroom instruction practices
«endif»«IF D105>79»• identifying effective practices for managing student behavior in the classroom
«endif»«IF D106>79»• specifying effective practices for managing student behavior in the classroom
«endif»«IF D107>79»• identifying appropriate objectives of a specific lesson
«endif»«IF D108>79»• describing teacher behaviors that promote learning
«endif»«IF D109>79»• giving a rationale for choosing teacher reinforcement practices
«endif»«IF D110>79»• identifying behavior and practices that interfere with learning

Instructional Leadership, Supervision (continued).

«endif»«IF D111>79»• giving rationale for choosing practices that need improvement
«endif»«IF D112>79»• stating clear and reasonable objectives for a teacher conference
«endif»«IF D113>79»• identifying questions, statements, and strategies for a post-observation conference which are designed to assist a teacher's professional development
«endif»«IF D114>79»• asking questions and taking actions [during a conference] that set goals, gain commitment, summarize, and reach closure
«endif»«IF D115>79»• preparing a written summary of a post-observation conference that includes clearly and precisely stated goals and objectives
«endif»«IF D116>79»• interpreting performance behaviors and communicating the interpretation to others
«endif»«IF D117>79»• evaluating the behavioral performance of others based on a variety of data sources
«endif»«IF D118>79»• observing, documenting, and describing behavior of others
«endif»«IF D119>79»• designing the improvement process

«endif»«endif»«IF D101<60 or D102<60 or D103<60 or D104<60 or D105<60 or D106<60 or D107<60 or D108<60 or D109<60 or D110<60 or D111<60 or D112<60 or D113<60 or D114<60 or D115<60 or D116<60 or D117<60 or D118<60 or D119<60»Responses pertinent to this dimension demonstrated *difficulty* in:
«IF D101<60»• describing the specific activities of the principal as an instructional leader
«endif»«IF D102<60»• describing the role of the principal as an instructional supervisor
«endif»«IF D103<60»• specifying major purposes for analyzing instruction
«endif»«IF D104<60»• identifying effective classroom instruction practices
«endif»«IF D105<60»• identifying effective practices for managing student behavior in the classroom
«endif»«IF D106<60»• specifying effective practices for managing student behavior in the classroom
«endif»«IF D107<60»• identifying appropriate objectives of a specific lesson
«endif»«IF D108<60»• describing teacher behaviors that promote learning
«endif»«IF D109<60»• giving a rationale for choosing teacher reinforcement practices
«endif»«IF D110<60»• identifying behavior and practices that interfere with learning
«endif»«IF D111<60»• giving rationale for choosing practices that need improvement
«endif»«IF D112<60»• stating clear and reasonable objectives for a teacher conference

Instructional Leadership, Supervision (continued).

«endif»«IF D113<60»• identifying questions, statements, and strategies for a post-observation conference which are designed to assist a teacher's professional development
«endif»«IF D114<60»• asking questions and taking actions [during a conference] that set goals, gain commitment, summarize, and reach closure
«endif»«IF D115<60»• preparing a written summary of a post-observation conference that includes clearly and precisely stated goals and objectives
«endif»«IF D116<60»• interpreting performance behaviors and communicating the interpretation to others
«endif»«IF D117<60»• evaluating the behavioral performance of others based on a variety of data sources
«endif»«IF D118<60»• observing, documenting, and describing behavior of others
«endif»«IF D119<60»• designing the improvement process
«endif»«endif

Human Relations Competence

Human relations competence is defined as follows: Perceives the needs, concerns and personal problems of others; recognizes conflicts; tactfully deals with individuals from varying backgrounds; effectively deals with people and emotional issues; knows which information to share and with whom.

«IF D200>79»The overall performance on this dimension was *exceptional*. «endif»«if DMAX=2»Responses to the exercises were in a range above those expected even for acceptable behavior. Additional training pertinent to this dimension may not provide much improvement.«endif»«IF D200<60»The overall performance on this dimension shows *strong potential for improvement*. «endif»«if DMIN=2»Responses to the exercises were in a range that may not be considered acceptable in some situations. This represents an area where it might be quite worthwhile to seek additional training for improvement in related skills.«endif»«IF D200<80 and D200>59»The overall performance on this dimension was *effective*. «endif»«if DMED=2»Responses to the exercises were in a range that is considered to be quite acceptable. Additional training related to this dimension may provide improvement, but should not be considered necessary to result in acceptable performance in this area.«endif»

«IF D201>79 or D202>79 or D203>79 or D204>79 or D205>79 or D206>79 or D207>79 or D208>79 or D209>79 or D210>79 or D211>79 or D212>79 or D213>79 or D214>79»Responses pertinent to this dimension demonstrated *high performance* in:

«IF D201>79»• demonstrating tactfulness and sensitivity in written and oral communication
«endif»«IF D202>79»• communicating correct information in a way that facilitates understanding by all parties
«endif»«IF D203>79»• listening attentively and actively during conversations and small group activities